The Software Review Process

Brenda S. Ocker

Chicago Aircraft Certification Office

brenda.s.ocker@faa.gov

Presentation Overview

- Background
- Overview of the Software Review Process
- Four Types of Software Reviews
- Preparing, Conducting, and Documenting the Software Review
- Determining the Level of FAA Involvement
- Summary

History

- Notice 8110.90, "Guidelines for the Software Review Process"
- Notice 8110.87, "Guidelines for Determining the Level of Federal Aviation Administration (FAA) Involvement in Software Projects"
- Draft Order 8110.SW, Chapters 2 and 3

DO-178B, Order 8110.SW, and the FAA Software Job Aid

- DO-178B sections 9.2 and 10.3 indicate that the certification authority may review the software life cycle processes and their outputs
- Order 8110.SW, Chapter 2 describes "WHAT"
- Order 8110.SW, Chapter 3 describes "WHEN"
- FAA Software Job Aid describes "HOW"

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Draft Order 8110.SW
Chapter 2

- Provides guidelines for performing software reviews
- Clarify software review process discussed in DO-178B
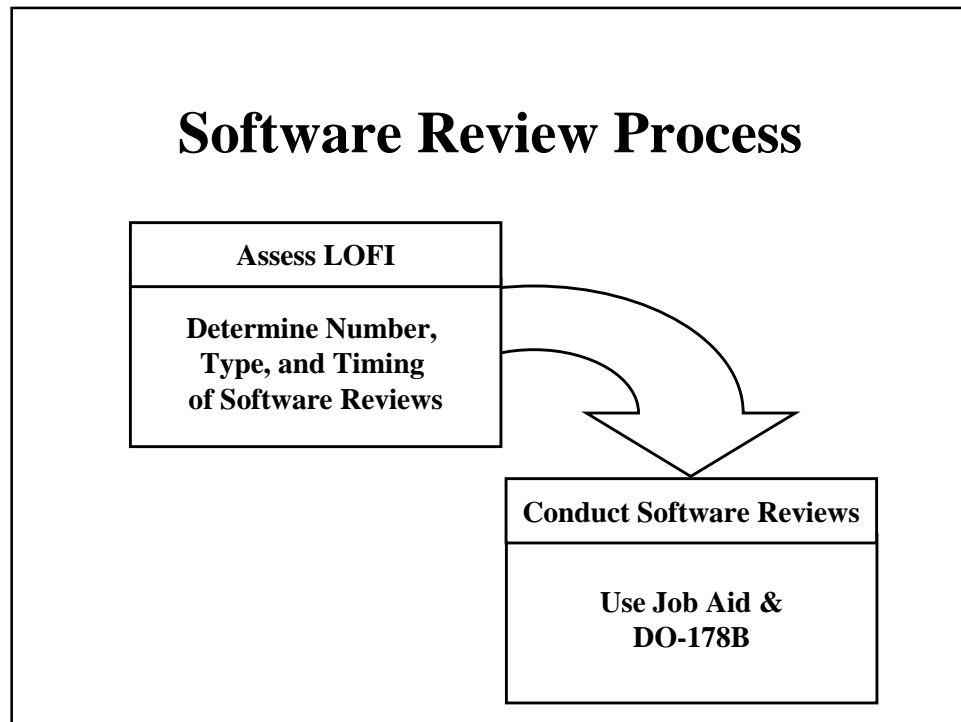- Standardize the review approach, which is detailed in FAA Job Aid "Conducting Software Reviews Prior to Certification"

Draft Order 8110.SW
Chapter 3

- Provides guidelines for determining the Level of FAA Involvement (LOFI) in a software project
  - When the FAA should be involved
  - To what extent the FAA should be involved
  - Which areas the FAA should focus their involvement

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Software Review Process

Assess LOFI
Determine Number, Type, and Timing of Software Reviews

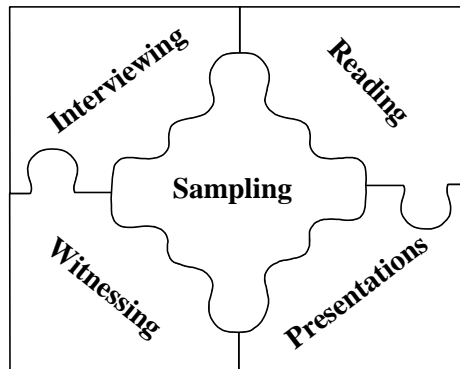| Conduct Software Reviews |
| :---: |
| Use Job Aid & DO-178B |

Definition of "Review"

- Process of examining software life cycle data, project records, and other evidence to determine if DO-178B objectives are satisfied

Data, Records, etc.

Typical Review Activities

Interviewing

Reading

Sampling

Witnessing

Presentations

Two Review Techniques

On-site

Desk

Findings and Observations

- Finding: Identification of a failure to show compliance with one or more of the DO-178B objectives.
- Observation: Identification of potential software life cycle improvement.
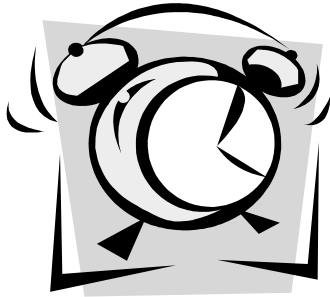
Purpose of Software Review

- Address technical issues in a timely manner
- Physically examine compliance data
- Verify adherence to plans and procedures
- Monitor designees

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Review Process & Life Cycles

- Reviews should begin early in the software life cycle

Four Types of Software Reviews

- Planning
- Development
- Verification
- Final Certification

Software Planning Review

SOI #1

Planning

Requirements

Design

Code/Integration

Integration/Test

- PSAC
- SDP
- SVP
- SCMP
- SQAP
- Standards
- Tool Qual. Plans
- SQA data
- SCM data

Tab A-8

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A-9, A-10**
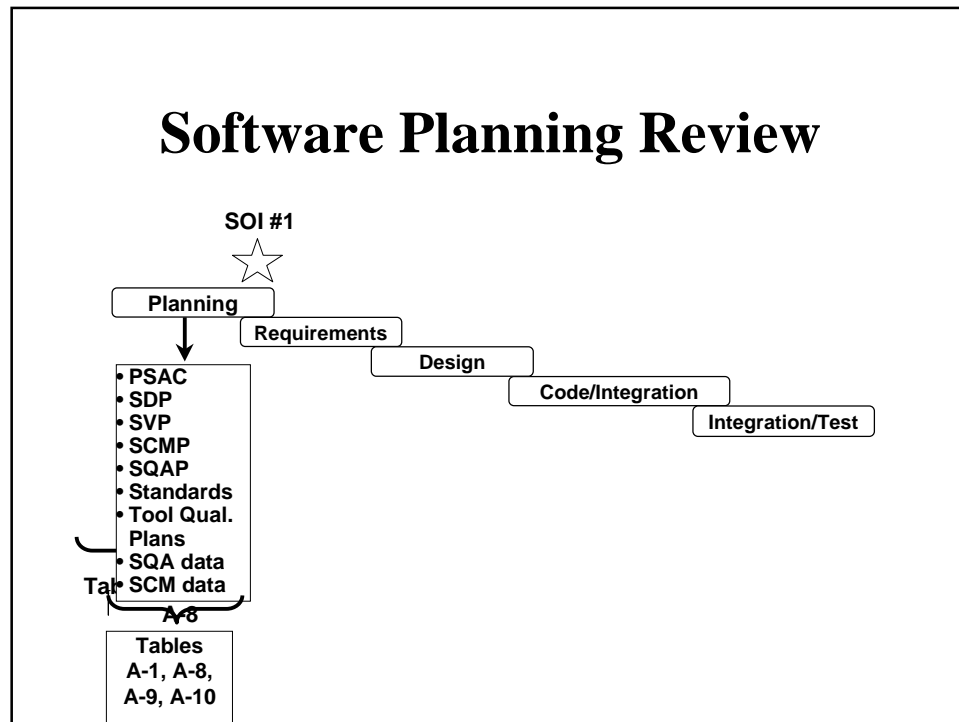
Software Planning Review

- Plans and standards are complete and under configuration control
- Plans and standards have been reviewed by SQA

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Software Development Review

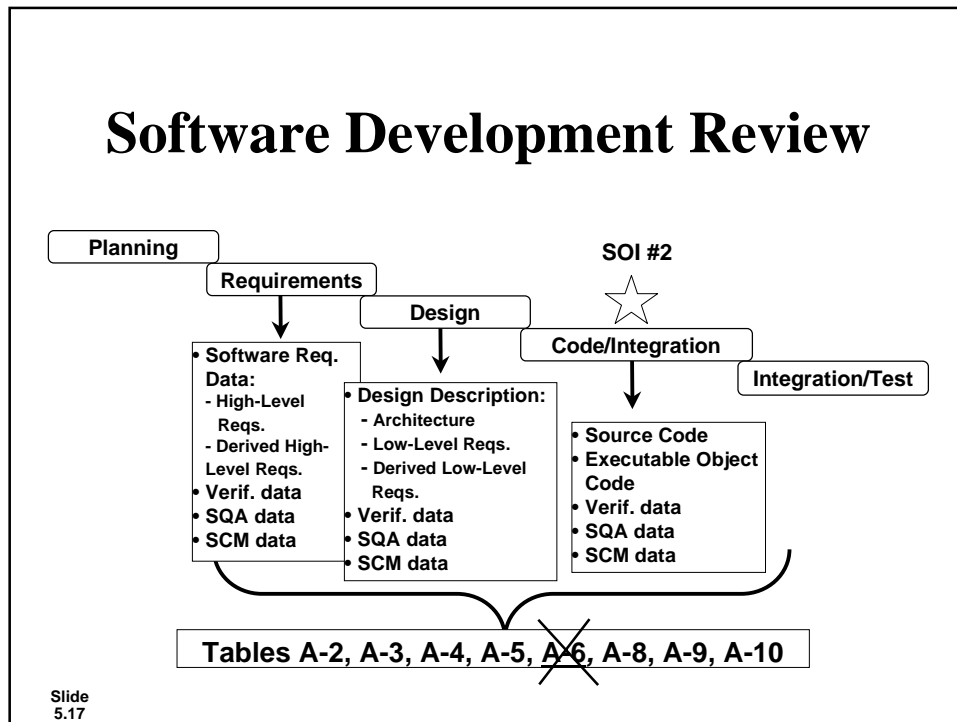|				SOI #2	

Planning

Requirements

Design

Code/Integration

Integration/Test

- Software Req. Data:
  - High-Level Reqs.
  - Derived High-Level Reqs.
- Verif. data
- SQA data
- SCM data

- Design Description:
  - Architecture
  - Low-Level Reqs.
  - Derived Low-Level Reqs.
- Verif. data
- SQA data
- SCM data

- Source Code
- Executable Object Code
- Verif. data
- SQA data
- SCM data

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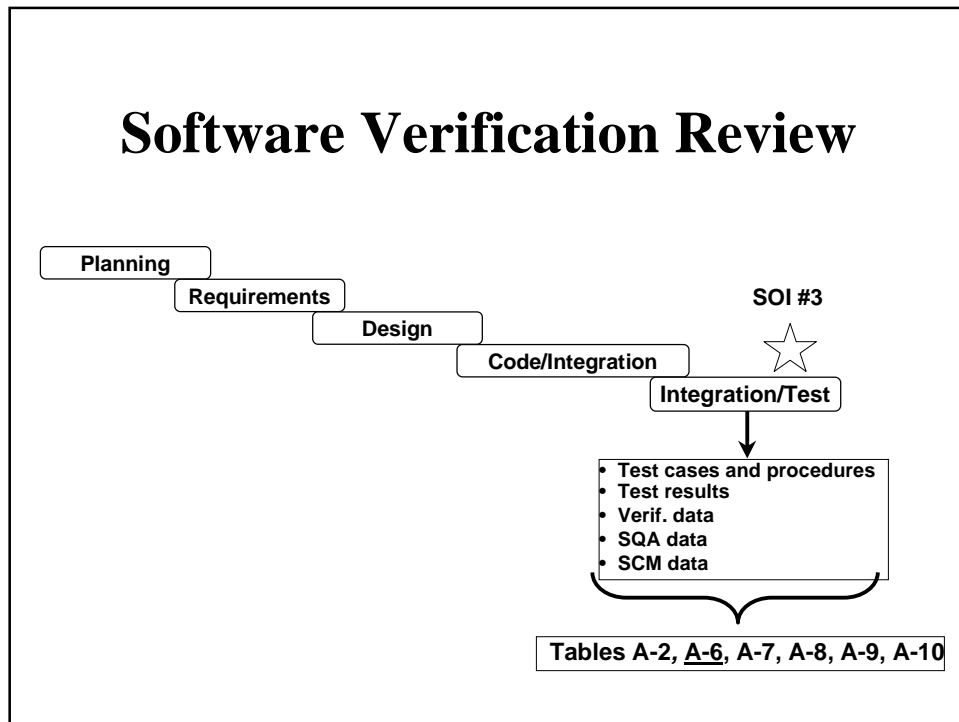
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Software Development Review

- High-level Requirements are complete and trace to Systems Requirements

- Software Architecture is complete

- Low-level Requirements are complete and Trace to High-level Requirements

- Source Code is complete and traces to Low-Level Requirements

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Software Verification Review

Planning

Requirements

Design

Code/Integration

Integration/Test

SOI #3

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- Test cases and procedures
- Test results
- Verif. data
- SQA data
- SCM data

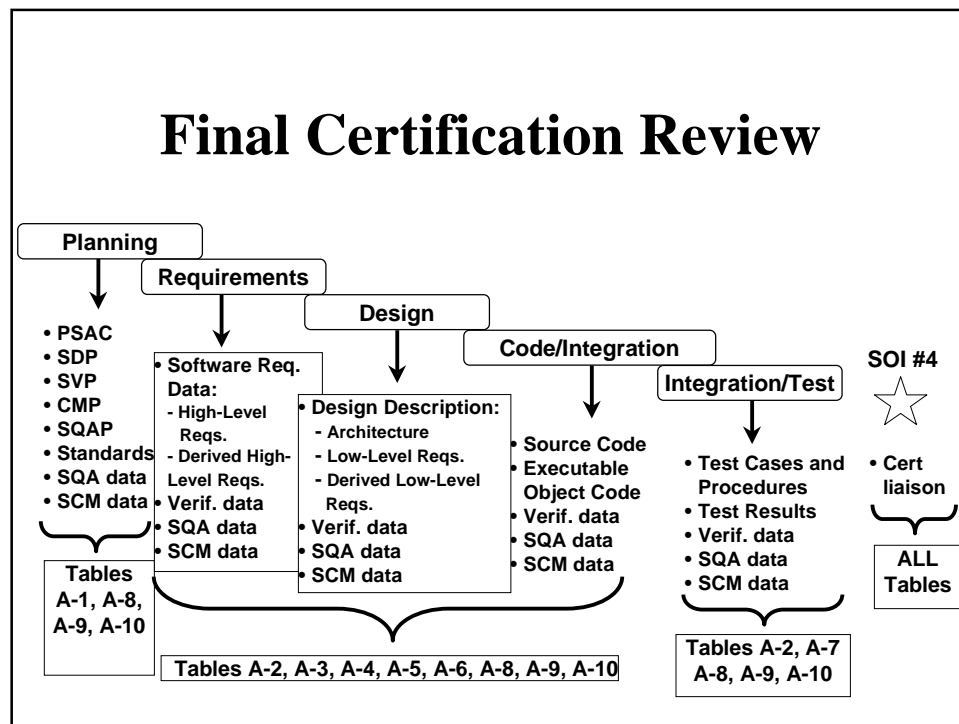Tables A-2, A-6, A-7, A-8, A-9, A-10

Software Verification Review

- Development data is complete and under configuration control
- Test cases and procedures are complete, reviewed, and under configuration control
- Testing environment is documented and controlled
- Testing is complete or well under way
- Test results are documented

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Final Certification Review

Planning

Requirements

Design

Code/Integration

Integration/Test

SOI #4

- PSAC
- SDP
- SVP
- CMP
- SQAP
- Standards
- SQA data
- SCM data

- Software Req. Data:
  - High-Level Reqs.
  - Derived High-Level Reqs.
- Verif. data
- SQA data
- SCM data

- Design Description:
  - Architecture
  - Low-Level Reqs.
  - Derived Low-Level Reqs.
- Verif. data
- SQA data
- SCM data

- Source Code
- Executable Object Code
- Verif. data
- SQA data
- SCM data

- Test Cases and Procedures
- Test Results
- Verif. data
- SQA data
- SCM data

- Cert liaison

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Tables A-2, A-3, A-4, A-5, A-6, A-8, A-9, A-10
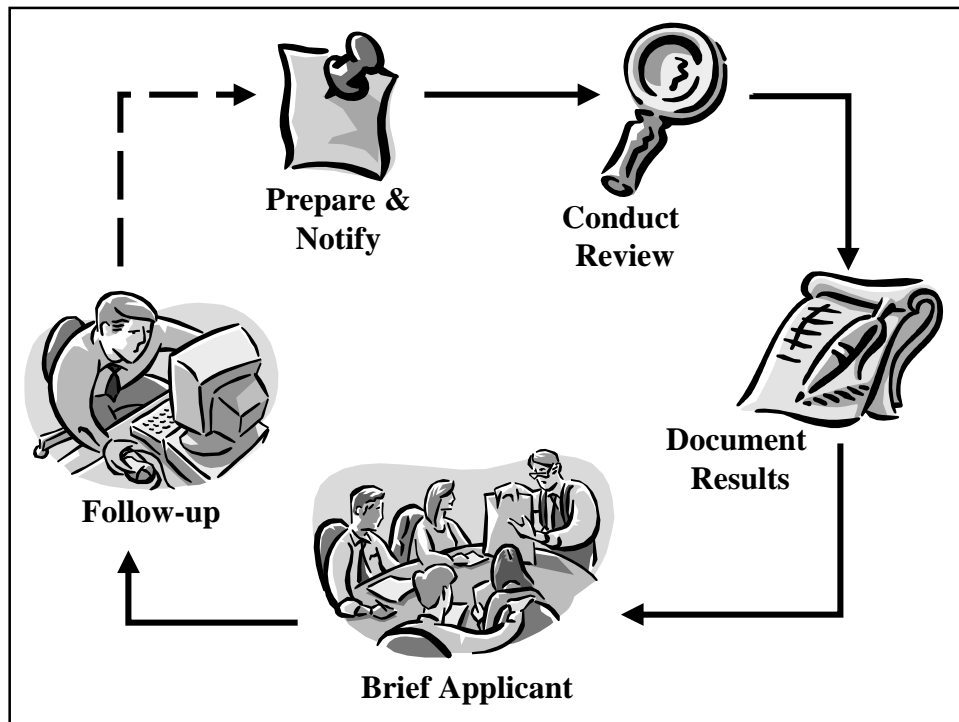
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ALL Tables

Final Certification Review

- Software Conformity Review has been conducted
- Software Accomplishment Summary and Configuration Index are complete
- All other Software Life Cycle Data are complete and under Configuration Control
- All Problem Reports, Action Items, and Certification Issues have been addressed

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Prepare & Notify → Conduct Review → Document Results → Brief Applicant → Follow-up

For Additional Information on Software Reviews

- Reference the FAA Software Job Aid - "Conducting Software Reviews Prior to Certification"
- View the Video Training on using the FAA Software Job Aid
- Go to the FAA Software Web-site: http://av-info.faa.gov/software/

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Level of FAA Involvement

- Number, type, and depth of reviews will vary depending on:
  - Software Level
  - Product attributes (e.g. size, complexity)
  - New technology or novel design
  - Experience with DO-178B
  - Experience with Certification
  - Designee Support
  - Other special considerations

Three Levels of Involvement

- High
- Medium
- Low

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Determining the LOFI

- Software level is the starting point:
  - Level A = Medium or High
  - Level B = Medium or High
  - Level C = Low or Medium
  - Level D = Low
- Reference Table 3-1 in draft Order 8110.SW

Determining the LOFI

- Need to consider other relevant criteria for levels A, B, and C
  - Software Certification Experience
  - Demonstrated Software Development Capability
  - Software Service History
  - Current System and Software Application
  - Designee Capabilities
- Reference Table 3-2 and 3-3 in draft Order 8110.SW

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Determining the LOFI

- Projects with issues that require new FAA policy typically require more FAA involvement
  - Level A and B = High
  - Level C and D = Medium

Determining the LOFI

- Determine the LOFI at beginning of project
- Use the worksheet in draft Order 8110.SW, Appendix 1
- Make adjustments to the LOFI during the project, if needed
- Reference the examples in draft Order 8110.SW, Appendix 2, 3, and 4

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Summary

- Overview of the Software Review Process
- Four Types of Software Reviews
  - Planning
  - Development
  - Verification
  - Final
- Preparing, Conducting, and Documenting the Software Review
- Determining the Level of FAA Involvement

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